

## CLAIMS

We claim:

1. A fuel and air mixer assembly, comprising:  
a mixer body forming an internal air chamber therein, the mixer body further defining an air intake and an air/fuel discharge conduit in communication with the internal air chamber;  
an air horn positioned in the air/fuel discharge conduit, the air horn having a flared end extending into the internal air chamber, the flared end of the air horn having an upper flat surface;  
a cover positioned on the mixer body, the cover having a shaped restriction body extending therefrom into the flared end of the air horn, the cover further defining a fuel discharge manifold therein; and  
a fuel spray plate positioned at an outlet of the fuel discharge manifold and defining a fuel discharge port thereat, the fuel discharge port being positioned in orthogonal alignment with the upper flat surface of the air horn, the fuel spray plate and the upper flat surface forming an air flow through region therebetween.
2. The assembly of claim 1, wherein the fuel spray plate has an outer diameter that is smaller than an inner diameter of an outer wall of the fuel discharge manifold thereby forming a single fuel discharge port around a periphery thereof.
3. The assembly of claim 1, wherein the fuel spray plate has an eccentric outer diameter that is smaller than an inner diameter of an outer wall of the fuel discharge manifold thereby forming a single fuel discharge port of varying width around a periphery thereof.
4. The assembly of claim 1, wherein the fuel discharge port is formed by a plurality of fuel delivery ports defined in the fuel spray plate.
5. The assembly of claim 1, wherein the fuel spray plate includes a region void of a fuel discharge port.
6. The assembly of claim 5, wherein the cover defines a fuel delivery conduit therein, the fuel delivery conduit coming into communication with the fuel discharge

manifold at a first location, and wherein the region void of a fuel discharge port is located in alignment with the first location.

7. The assembly of claim 1, wherein the flared end of the air horn includes an outer surface that is radiused to provide a smooth flow path therearound to minimize turbulence generated in a vector redirection of airflow through the air flow through region.

8. The assembly of claim 1, wherein a position of the air horn may be varied to vary an amount by which the air horn extends into the internal air chamber, thereby varying a cross-sectional area of the air flow through region.

9. The assembly of claim 1, wherein the fuel spray plate, shaped restriction body, and the upper flat surface of the air horn form a Venturi.

10. A gaseous fuel and air mixer assembly for use in an internal combustion engine, comprising:

a mixer housing having an air inlet and a fuel/air outlet, the mixer housing forming an internal air chamber therein;

an air horn extending into the internal air chamber from the fuel/air outlet, the air horn having a flared end having a radiused outer surface to reduce turbulence generated in a vector redirection of air flowing from the internal air chamber to the fuel/air outlet, the air horn further defining an upper flat surface;

a cover having a conular restriction body extending therefrom into the flared end of the air horn forming a Venturi, the cover further including a fuel discharge port orthogonally positioned relative to the upper flat surface in the Venturi.

11. The assembly of claim 10, wherein the fuel discharge port is formed by a fuel spray plate positioned in a fuel discharge manifold defined in the cover.

12. The assembly of claim 11, wherein the fuel spray plate has an outer diameter that is smaller than an inner diameter of an outer wall of the fuel discharge manifold thereby forming a continuous fuel discharge port around a majority of a periphery thereof.

13. The assembly of claim 11, wherein the fuel spray plate has an eccentric outer diameter that is smaller than an inner diameter of an outer wall of the fuel discharge

manifold thereby forming a continuous fuel discharge port of varying width around a periphery thereof.

14. The assembly of claim 13, wherein the cover further defines a fuel delivery conduit therein in communication with the fuel discharge manifold, and wherein a first width of the fuel discharge port at a first position in proximity to a union of the fuel delivery conduit and the fuel discharge manifold is wider than a second width of the fuel discharge port at a second position in proximity to the air inlet.

15. The assembly of claim 11, wherein the fuel discharge port is formed by a plurality of fuel delivery ports defined in the fuel spray plate.

16. The assembly of claim 11, wherein the fuel spray plate includes a region void of a fuel discharge port.

17. The assembly of claim 10, wherein the radiused outer surface and the upper flat surface are configured to provide essentially non-turbulent air flow through the Venturi in a direction orthogonal to the fuel discharge port to enhance mixing of air and fuel in the assembly.

18. The assembly of claim 17, wherein a position of the air horn in the internal air chamber relative to the conular restriction body is variable.

19. The assembly of claim 10, wherein the cover further defines a fuel delivery conduit therein in communication with the fuel discharge manifold.

20. The assembly of claim 18, wherein the fuel delivery conduit is closed at an end opposite the fuel discharge manifold by an end cap.